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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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SIEMENS CORPORATION
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EXAMINER	
VALONE, THOMAS F	
ART UNIT	PAPER NUMBER
2831	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/533,014	BOSSELMANN ET AL.	
	Examiner	Art Unit	
	THOMAS F. VALONE	2831	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-25,27-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-25,27-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 21-25, 27-36 and 41 are rejected under 35 U.S.C. 103(a) as being obvious over Ding (4,804,905) in view of Strangman (5,514,482) and Deegan (5,552,711) of record.

Regarding claims 21-23, 30, 32, 33 and 41, Ding teaches a rotor blade measuring element for electric charge distribution (Fig. 3-5 and col. 4, line 5-15) arranged near the row of rotor blades (col. 3, line 5-30), an electrically connection to a reference potential for the blades (Fig. 5) and teaches a frequency range that is at least in the kilohertz band (col. 2, line 26) as in claims 21, 23, 32, 41. Ding further teaches the deviation from a threshold responsive to a location of the rotor blades arranged on a rotor shaft (Fig. 2), relative to the outlet of the engine (col. 5, line 40). Ding includes a description of the radial disposition of a measuring element (col. 5, line 45-50). Ding further teaches a steady state or transient measurement (col. 5, line 14-35). For the deviation from a threshold, in light of the specification, the “amplitude height” in the time domain or the frequency domain (instant disclosure, p. 3, par. 9) is the predominant measure of quality of the electric field generated by the blade or vane charges and the

definable threshold, which is the same teaching of Ding (col. 3, line 9 and Fig. 2), as in claims 21, 22, 23, 32, 41. Ding also correlates the variation of the magnitude of the signal according to the amplitude height or magnitude of the other blades (col. 5, line 37-40) or guide vanes (col. 8, line 36 and Fig. 1a) thus performing the same function and intended use as in claims 22 and 33. For a threshold responsive to a location of the rotor blades or the guide vanes relative to an outlet of the turbo engine, Ding teaches a monitoring unit using signals from the pressure, temperature and speed measurements outlet load condition of the engine (col. 7, line 45-55) to compare to a deviation from a threshold location, comparing the signal from one blade to the signals from other blades, which determines how the signal deviates (col. 8, line 56-65).

Ding does not teach electrically conducting blades having an electrically insulating surface coating and Ding does not teach the strength of the electric field as an indication of a level of wear or defect that can arise in the electrically insulating surface.

Strangman teaches a plurality of turbine rotor blades and vanes (22, 24, Fig. 3, abstract and col. 5, line 67) made of an electrically conducting material (metal, col. 2, lines 5-10) having an electrically insulating coating surface (ceramic zirconia, col. 6, lines 1-30) as in claim 30, arranged on a rotor shaft (20, Fig. 3) that is rotatably mounted in a housing. It is well known to one of ordinary skill that good thermal insulators, such as zirconia, will also have good electrical insulative properties, since they are similar effects, which is confirmed by any standard handbook for electrical engineers.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included Strangman's plurality of metal rotor blades that are electrically insulated in Ding's turbo engine measuring and monitoring system, for the benefit of increased charge retention for a maximized sensor performance as well as improved thermal insulating effects that provide higher strength and increased temperature range, as suggested by Strangman (col. 8, line 11-20 and col. 6, line 10-20).

Ding as modified by Strangman (D-S) does not teach the strength of the electric or magnetic field as an indication of a level of wear or defect that can arise in the electrically insulating surface.

Deegan, from the same field of endeavor, teaches that the source strength of ions (electric field measurement) changes with wear or defect, such as small flaws, intergranular cracking, or even crystalline erosion (col. 2, line 30-40 and line 53-57) on a blade surface, that contribute to development of hot spots, all of which could reasonably occur to an electrically insulating surface, to one of ordinary skill. Deegan further teaches spectrum analysis (col. 3, line 19) and filtering in the kilohertz frequency range (col. 2, line 40) as well. Deegan also teaches measuring the strength (level detection, col. 3, line 7-20) of the electric field antenna as an indication of defect or wear and that the exposure of metallic ions in a hot spot of wear and defect causes a level change that is measurable with a simple antenna and radio receiver (col. 1, line 50-55), which would also be reasonably related to a failure of insulation as well, to one of ordinary skill, as in claims 21, 32, and 41.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used Deegan's monitoring of electric field strength as an indication of wear or defect that can arise in the electrically insulating surface of the D-S rotor blade, for the benefit of early detection to prevent catastrophic damage and destruction, as suggested by Deegan (col. 1, line 19-25).

Regarding claim 24, Ding uses an improved coaxial antenna which has an extra coaxial layer (col. 6, lines 23-55).

Regarding claims 25 and 27, at least one of the measuring elements of Ding are connected to a measuring unit (col. 4, lines 39-42 and Fig. 3-4) connected to a control center (computer 10, col. 5, line 8).

Regarding claim 28, measuring, monitoring and control center inherently comprises a signaling device (electric control unit 56, col. 7, lines 45-53 and Fig. 9).

Regarding claim 31, Ding's turbine engine is a gas turbine as well (col. 7, lines 15-20).

Regarding claim 34, Ding teaches the deviation is determined by a measuring (col. 5, lines 8-15) and monitoring unit (col. 6, lines 36-7 and Fig. 3) and transmitted to a control center (computer 36, col. 5, line 14).

Regarding claims 29, 35 and 36, the teachings of D-S are reviewed above.

D-S does not include the aspect of does not include the aspect of an alarm output or engine shut down by a monitoring unit when a threshold value is exceeded.

Deegan, from the same field of specialty, teaches the shutting down of the turbine engine by the monitoring unit (Fig. 1A) when a definable threshold value is

exceeded (col. 4, lines 12-14), as in claim 29. Deegan further teaches the shutting down of the turbine engine by the monitoring unit (Fig. 1A) when a definable threshold value is exceeded (col. 4, lines 12-14), as in claim 36, and also the concept of registering an alert (col. 3, line 22), which is inherently an alarm, as in claim 35.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included Deegan's teachings of an alarm and shut down by the monitoring unit in the invention of D-S, for the benefit of preventing catastrophic failure and costly damage of the turbine engine when a threshold value is exceeded, as suggested by Deegan (col. 1, line 22).

3. Claims 37 - 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ding, Strangman and Deegan (D-S-D), as applied to claims 21-25, 27-36 and 41 above, and further in view of IEEE Interharmonic Task Force of record.

The teachings of D-S-D are reviewed above. Deegan further teaches the use of a measurement signal processor which performs a spectrum analysis transformation with the product of this analysis passed onto a display device (col. 3, lines 19-20), as in claim 39, and compared to a definable threshold value (predetermined level, col. 4, line 14), as in claim 40.

D-S-D does not explicitly include a signal transformation by a fast Fourier transform (FFT) where it is displayed and/or signaled and compared with a definable threshold value and does not explicitly address a Fourier transformation, though it is inherent to spectrum analysis.

The IEEE Interharmonic Task Force, which refers to its work with turbine engines (p. 3, 2nd col., line 21) does include spectrum analysis (Figure 5) and the connection between such analysis and the Fast Fourier Transformation (p. 5, 2nd col., par. 4), as in claims 37 and 38.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included FFT spectrum analysis, as taught by the IEEE Interharmonic Task Force, of the signal from a measuring element of D-S-D, for the benefit of preventing catastrophic failure by filtering a specific frequency and setting an alarm when that frequency component exceeds a predetermined threshold value, as suggested by Deegan (col. 1, line 22).

Response to Arguments

4. Applicant's arguments filed 4/7/08 have been fully considered but they are not persuasive.

The arguments center around the amended claim language and argues that the primary reference Ding does not teach the strength of the electric or magnetic field as an indication of a level of wear or defect that can arise in the electrically insulating surface. The argument is moot in view of the new grounds of rejection.

The further arguments simply assert the patentability of the claims 29, 35, 36, and 37-40 without presenting specific features that define over the prior art.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rickards teaches an electrical capacitance clearanceometer.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS F. VALONE whose telephone number is (571)272-8896. The examiner can normally be reached on Tu-W-Th, 10:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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